

U.S. Serial No. 09/978,510
Reply to Office Action of: 02/05/2004
Family Number: P2000J095 US2

REMARKS

The present invention is directed to the discovery that, contrary to the teachings of the prior art regarding diesel engine performance as a function of diesel fuel density, a high pressure common said fuel injected diesel engine can be run at a reduced emissions output level using a low density diesel fuel without the same level of power loss as is inevitably experienced by ordinary diesel engines run on low density fuels as is taught in the literature.

The Examiner repeats his rejection of the claims as obvious relying on Barry et al (USP 5,976,201), arguing that Barry et al discloses a diesel fuel having a specific gravity in the range 0.82 to 0.83, a viscosity in the range 1.7 to 1.9 cSt @ 40°C, a sulfur content not greater than 0.1 wt% and indeed, as shown in one example a sulfur content of 0.01%.

While Barry et al does not address high pressure common rail fuel system compression ignition engines the Examiner concludes that it would be obvious to those of ordinary skill to utilize the fuel of Barry et al in a high pressure common rail fuel system compression ignition engine because one would expect to be able to use any known diesel fuel in any known diesel engine regardless of its specific feature and expect the engine to work effectively.

The Examiner rejects applicants arguments that the use of a lower density fuel in high-pressure common rail fuel injection diesel engine unexpectedly does not result in power loss. The Examiner argues that the literature regarding such engines disclose that such engines result in higher fuel efficiency, better engine performance and better vehicle response and acceleration as compared to conventional diesel engines. The Examiner concludes that the power loss amounts referred to by Applicants are not unexpected in view of the inherent advantages of high pressure common rail fuel injected diesel engines.

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Applicants must respectfully traverse this rejection.

As correctly pointed out, Barry et al discloses a lower viscosity diesel fuel. As also correctly pointed out, high pressure common rail fuel injected diesel engines are described in the current literature (2000-2004) and such engines are indeed described as giving drivers the benefits of lower fuel consumption, better engine performance, less noise, higher power and better vehicle response and acceleration.

While all that may be true, the statements regarding the high pressure common rail fuel injected diesel engine's superiority regarding power, vehicle response and acceleration are all in comparison to and with respect to the conventional diesels and make no allegations regarding engine performance as a function of fuel type.

To "expect the engine to work effectively" does not necessarily mean that the engine will not experience some measurable power loss (evidenced by a reduction in acceleration) as is commonly experienced with conventional diesel engines when one switches from a high density to a low density fuel. To work effectively is what is minimally expected, that the engine will run, will not stall, and will not excessively pollute.

Based upon the prior art the best that could be expected in terms of "working effectively" would be that the new engine, despite being more powerful, lower polluting and having higher absolute power, vehicle response and acceleration, would still exhibit the tendency common to the other diesel engines of significant power loss upon switching from high density to a lower density diesel fuel.

While it may be obvious to try using just about any "diesel" fuel in any "diesel engine" it is not obvious that diesel engines of different types will respond differently to diesel fuels of different types.

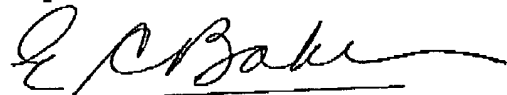
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Common, ordinary diesels loss power when switched from high density fuel to low density fuel. Nothing in the literature, including the teaching that high pressure common rail fuel diesel engine are of higher power, better acceleration and have better vehicle response than common ordinary diesel would lead one necessarily to expect that were as the ordinary diesel last power when switched from high density to low density fuel, the high pressure common rail diesel engine will be found not to experience or evidence the same level of power loss. The discovery that high pressure common rail diesel engines do not suffer the same power loss as experienced by ordinary diesel engines upon switching from high density to low density fuel is the unexpected result and the essence of the presently claimed invention. This is not taught, suggested or implied in the art.

It is requested that the Examiner reconsider the case in light of the above remarks, that he withdraw the rejection, allow the claims and pass the case to issue in due course.

Respectfully submitted,



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☒ Pursuant to 37 CFR 1.34(a)

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